Metropolitan Planning Authority

Leneva-Baranduda Precinct Structure Plan

High Level Utility Servicing and Infrastructure Assessment

July 2015

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1. Introduction

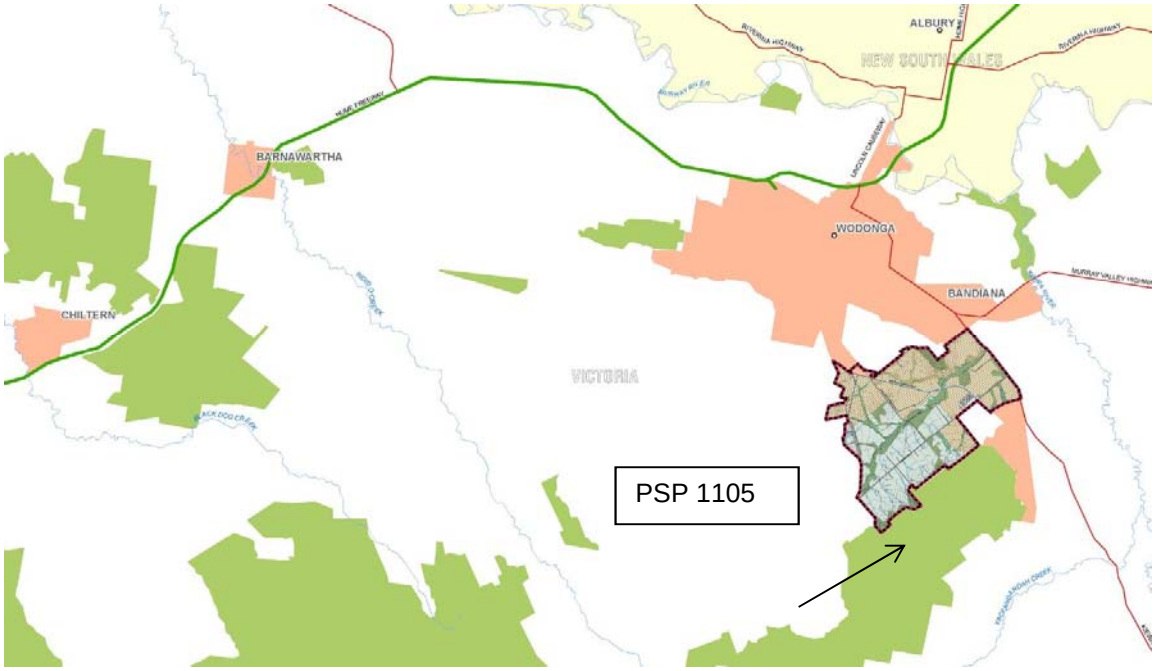
GHD has been commissioned by the Metropolitan Planning Authority (MPA) to undertake a high level utilities capacity assessment for the Leneva Baranduda Precinct Structure Plan Area (PSP 1105) in the City of Wodonga, Victoria. The site location of the PSP is illustrated in Figure 1.

The proposed development area is bordered to the west by the Beechworth-Wodonga Road, to the east by the Kiewa Valley Highway and to the southeast by both Boyes Road and the base of the Baranduda Ranges. The northern part of the area is bordered by the South Bandiana Defence Base, Bears Hill and Martins Road.

In the City of Wodonga's 'Discussion Draft Leneva-Baranduda growth area framework plan 2012', it is stated that the majority of the PSP's development will comprise residential land development occupying approximately 15 lots per hectare. There are small sections of medium density land development occupying approximately 20 lots per hectare. The framework has provided an estimate of 14,000 lots with an estimated population of approximately 35,000 people living in the PSPs.

This report provides high level detail of GHD's infrastructure investigation for the PSPs. The investigation reports on existing trunk infrastructure, proposed servicing strategies, service constraints and opportunities.

Figure 1 Site Location Sketch



2. Methodology

2.1 General

GHD conducted a general servicing location enquiry for all relevant services via Dial Before You Dig in May 2015, and has received existing services plans from all relevant authorities. Upon receipt of these plans, brief discussions were held with each service authority to determine relevant contacts to provide further advice regarding the proposed future development. Digital copies of services plans were requested and used to create existing services plans shown in Appendix A.

Formal requests for further servicing advice were issued to all relevant authorities and subsequent meetings were held with a number of the stakeholder authorities. Phone and email discussions were undertaken to confirm and expand on all relevant servicing information.

A detailed review and analysis of the available service authority information was undertaken and broad high level service capacity and strategy advice was obtained from all service providers listed under Section 2.2 of this report. Meetings were held with the following service authorities in addition to receiving formal servicing information:

- APA Gas Network
- Ausnet
- North East Water
- City of Wodonga Council

2.2 Service Authorities

GHD has contacted all relevant service authorities to obtain plans and details of existing services in the PSPs, with specific reference to the immediate area bound by the proposed development site.

The following asset owners and service providers were contacted:

- Electricity Transmission - Ausnet;
- Electricity Distribution – Ausnet
- Telecommunications - Telstra;
- Telecommunications - NBN Co;
- Gas Reticulation –APA Network
- Gas Transmission - APA Group;
- Sewer, Water and Recycled Water – North East Water
- Stormwater Drainage – City of Wodonga

Available service capacity, infrastructure strategies and high level costing advice received from the authorities has been gathered and detailed in the following sections.

Generally, service authorities have informed that further consultation is required when functional designs are completed for the significant infrastructures to ensure service strategies are amended accordingly.

3. Electricity

3.1 Responsible Authorities

Ownership of power assets in Victoria is split between the transmission network and the distribution network. The majority of the transmission network in Victoria is owned, maintained and operated by Ausnet Services (formerly SPAusnet).

Within regional Victoria, Ausnet services own, operate and maintain the distribution network to east Victoria which commences on the outskirts of north east and east Melbourne and continues to the Victorian/New South Wales border in Gippsland and North east Victoria.

As part of this assessment Ausnet Services were consulted for both the transmission and distribution networks.

3.2 Terminology

The transmission network includes terminal stations and transmission lines, which connect the power stations to the terminal stations.

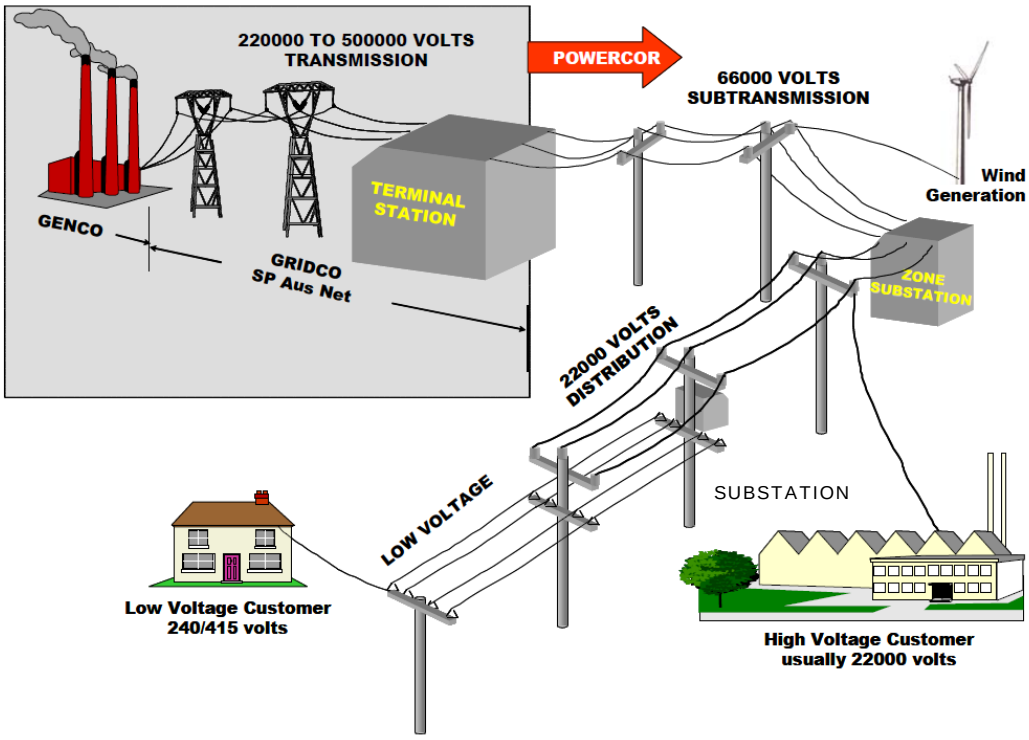
The distribution network connects to the Terminal Stations, and extends to the individual properties.

The distribution network comprises the following components:

- Sub-transmission lines that connect Terminal Stations to Zone Substations
- Zone substations
- Distribution Feeders – either overhead or underground lines that connect Zone Substations to Local Substations
- Substations – indoor, kiosk or pole mounted
- Low Voltage Power lines – either overheard lines or underground cables connecting the substations to the customers

The components of typical transmission and distribution networks are broadly described in Figure 2.

Figure 2 Typical Electricity Transmission and Distribution Network



Source: CitiPower 2011 'Distribution System Planning Report' p10

3.3 Existing Services and Assets

Existing transmission and distribution electricity infrastructure for the PSPs is shown in Plan 1 in Appendix A.

3.3.1 Transmission Network

The existing transmission network consists of a 330kV transmission line that supplies the Wodonga Terminal Station (WOTS) located on Whytes Rd Bandiana. The transmission lines enter the station from the north east. Also entering the terminal station is a 66kV supply from the small hydro power plant located on the Hume Weir.

Two 66kV sub-transmission lines leave the terminal station along Whytes Rd and Kiewa Valley Highway and travel to the west to supply the Wodonga Zoned Substation.

The terminal station is in close proximity to the PSP with the eastern edge being only approximately 1.2km from the terminal station. The existing transmission lines do not infringe on the PSP with the lines being to the north east and the PSP to the south west.

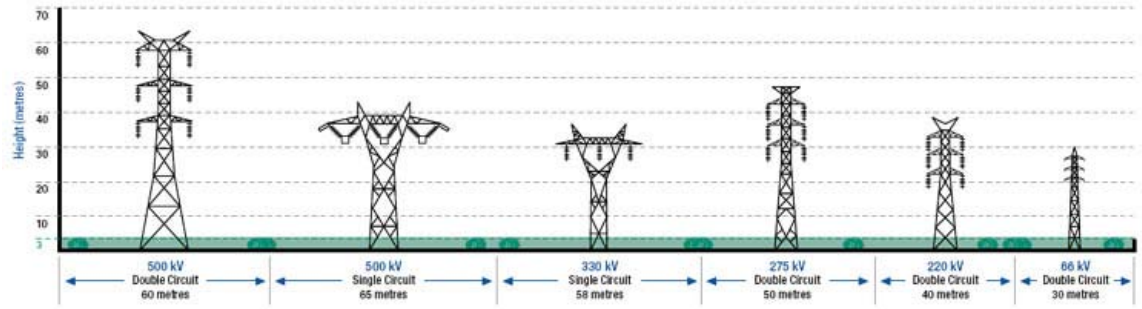
There are no new transmission lines planned to supply this terminal station but there is enough capacity at the terminal station for the installation of another transformer.

Transmission Easements

The corridors of land that contain transmission towers and power lines are referred to as transmission line easements. Easements secure a 'right of way' for the safe transmission of power.

Usually Ausnet does not own the land contained within the easement, they instead have acquired rights for its use by agreement with and compensation of the original landowner for maintenance and access to the network. There are restrictions relating to what activities can occur within Ausnet's easements and what can be located within easements. Typical easement widths based on the type of tower are shown in Figure 3.

Figure 3 Electricity Transmission Easements



Source: SPI PowerNet "Electricity transmission easements' Retrieved 28 June 2012 from http://www.sp-ausnet.com.au /?id =2301331700507AA09DC076AAEBCA2575760038DB0A

Building and Works within Easements

The types of activities and buildings and other structures that can be built on easements are tightly controlled by Ausnet, AEMO and Energy Safe Victoria. There are strict limits on what can and can't be built on easements so that public safety and the reliability of the transmission network are not compromised.

Suitable land uses for underground cable easements include grassed or paved areas. No variation in finished surface levels is permitted following design and construction and no buildings or other structures can remain in the easement. Ausnet has a document called *Guidelines for Subdivision and Development of Land Affected by Transmission Line Easements* which should be referred to throughout the master planning and design stages of redevelopment.

3.3.2 Distribution Network

The developed suburbs in closest proximity to the PSPs are serviced by the Wodonga Terminal Station and the Wodonga Zone sub-station. The Wodonga (WZS) zone substation services the west of Wodonga and is supplied via two 66kV sub-transmission line from the Wodonga (WOTS) terminal station.

3.4 Planned Works

3.4.1 Transmission

Ausnet has stated that the Wodonga Terminal Station has enough capacity to provide the PSP with electricity for a substantial amount of years and therefore no works to the terminal station has

been planned for the near future. Ausnet will monitor the growth and demand on the terminal station and will complete any works necessary when the demand reaches a specific level.

3.4.2 Distribution

The existing Wodonga terminal station is currently at capacity. Ausnet have stated that any upgrade works will be dependent on the uptake of lots and the electricity demand as the development progresses. The existing feeders in the area will be utilised initially to supply the development. Ausnet will monitor the demand and as the development progresses and will implement the most cost effective solution at the time to meet the predicted demand.

3.5 Proposed Servicing Advice

Ausnet has advised that the PSP will be supplied by the nearby Wodonga Terminal Station and will not require any upgrades or new zone substation. There is room at the terminal station for another transformer that can convert the 330kV transmission supply down to 66kV and 22kV. Ausnet will monitor the demand from the development and installation of the transformer will be implemented once the demand reaches a specific level.

3.6 Key Development Opportunities and Constraints

The cost difference between the provision of overhead power and underground power is significant. One kilometre of 22 kV cable is estimated to cost $200,000 for overhead infrastructure and approximately $400,000 for underground construction.

On an even larger scale, one kilometre of 66 kV cable costs approximately $400,000 for overhead while for underground 66 kV feeders, the cost is approximately $4 million. The exact cost of underground power will vary depending on trenching conditions and a number of other factors.

Under Ausnet's current policy arrangement, Ausnet will fund the cost of High Voltage (HV) materials (for 22 kV overhead underground) and substation within a continuous medium density development as well as contribute a standard $980 per lot towards the cost of Low Voltage (LV) materials.

While Ausnet funds the cost for new HV materials within a residential development, relocation of existing 66 kV or 22 kV infrastructure underground, or construction of new 66 kV infrastructure underground, may be borne by the developer.

In an instance where a developer proposes to develop a portion of land out of sequence to the rest of the development this will prove more difficult to manage as the planning, construction and costs will be substantial and these costs shall be borne by the developer.

4. Telecommunications

Telstra is the authority responsible for the existing supply and reticulation of telecommunication services within the established areas near to the PSPs.

Broadband supply to the development is to be provided by NBN Co. NBN Co is wholly Government owned, with the role to design, build and operate the NBN. NBN Co will become the wholesale provider of fixed line and fixed wire telecommunications through a network of fibre optic cables and wireless infrastructure to be rolled out over the next 10 or so years. The key component of the NBN is that it is to be an open access network. This will allow any Retail Service Provider to enter into an access agreement with NBN Co, and ultimately to sell services to consumers. The network is to be a combination of fibre to the premises, fixed wireless and satellite services. The fixed wireless and satellite services are intended for areas where the rollout of fibre optic cable is uneconomical. Currently the majority of the PSP area is covered by the fixed wireless service.

The current NBN Co rollout of fixed wireless network coverage for the PSP is shown in Plan 7 in Appendix A.

4.1 Existing Services

Existing telecommunications infrastructure is shown in Plan 2 in Appendix A.

Plans provided by Telstra indicate telecommunications infrastructure is located on Boyes Road along the south east border of the precinct, Beechworth-Wodonga Road on the western border, along Martins Road on the northern border and on Fredric Street Road traversing through the middle of the precinct. Generally, telecommunications infrastructure is located within the road reserve and at a nominal depth of 600mm from the surface level.

Currently there are no NBN underground cables in the PSP area although there are underground cables installed in new small developments in the Streets Road area north of the PSP. The majority of the PSP however is covered by a fixed wireless network and at the time of this report no information was obtained from Telstra or NBNCo on how the areas with no fixed wireless coverage were to be provided with NBN

4.2 Key Opportunities and Constraints

Telstra has informed that any provision of their infrastructure would be with regards to commercial development and Telstra may overlay infrastructure in the area to reach specific customers including businesses or government properties.

NBN Co has currently installed a fixed wireless network that covers the majority of the PSP. In the areas that are not covered by this fixed wireless network the developers will have to install underground infrastructure.

It would be beneficial to advise Telstra and NBN Co of any undergrounding of electricity cables to maximise the possibility of co-location between electricity and telecommunications assets.

NBN Co has advised that it is too early to recommend staging and easement requirements, as this will depend upon whether developers apply to NBN Co for infrastructure.

5. Gas

5.1 Responsible Authorities

APA Group is the transmission pipeline network asset owner. The transmission of natural gas involves transporting gas through pipelines from extraction to reticulation processing facilities at city gates or field regulators, and direct supply to major customers, including distribution businesses. Generally, transmission pressures operate between 2,800kPa and 10,000kPa and are far too high to directly service end users. The process of downgrading to distribution pressures in order to service end-users is generally achieved via an off take (or tapping) connected to the transmission pressure main. This tapping includes a gas city gate, custody transfer meter (CTM) and regulator heater. The CTM measures the quantity of gas extracted from the supply transmission pipe while a regulator heater is also necessary to offset the temperature decrease experienced when pressures are lowered.

APA Networks is the asset owner responsible for the gas distribution network within the PSPs and is also responsible for the city gates, CTMs and heaters. Gas is depressurised at city gates and field regulators to appropriate pressures for the distribution of gas to final users which can include commercial and industrial users as well as residential users. Gas is transported in smaller volumes and at lower pressures through the distribution networks than along the transmission pipelines.

GHD met with APA Networks to discuss their strategic servicing plan for PSPs area

5.2 Existing Services and Assets

Existing transmission and distribution gas infrastructure is shown in Plan 3 in Appendix A

5.2.1 Transmission Network

The transmission lines supplying Wodonga traverse along the Hume Freeway at a pressure of 1600 kPa before branching off via a 300 mm main that travels along Melbourne Road. It is reduced down to a 200 mm main via a regulator pit at the Melbourne Road-Melrose Drive intersection. The 200 mm main terminates at the Hume St Gas Regulator pit. From this pit the gas is distributed Wodonga, Bandian, Bonegilla and Killara

This transmission main are owned and operated by APA Gas Networks.

5.2.2 Distribution Network

There is currently no distribution gas infrastructure within the PSP. The nearest existing distribution gas is situated in Streets Road to the northwest and Baranduda to the southeast. APA Networks has advised that this infrastructure is adequate for the supply of gas to within the PSP

The nearest existing city gate is located at the Old Barnawartha Road.

5.3 Proposed Servicing Advice

APA Networks intends to extend the existing 180 mm diameter HDPE main located in Streets Road in progressive increments that will meet the development demands as they occur. This main extension is proposed to connect to the 180 mm diameter HDPE main located in Baranduda Boulevard at the Westmont Aged Care facility.

APA Networks has advised that no additional city gates are required to service the PSP as there is sufficient capacity for the mixed use development.

5.4 Key Development Opportunities and Constraints

APA Gas Networks have stated that the supply of gas to the PSP will be straightforward as long as the development commences at the northern part of the precinct and progresses southeast towards Baranduda. This will enable APA Gas Networks to install the required gas infrastructure in small sections with no extensive construction works required or large capital outlay.

In an instance where a developer proposes to develop a portion of land centrally located within the precinct this will prove more difficult to manage as the planning, construction and costs will be substantial.

5.4.1 Spatial Requirements

Easements

APA Networks envisage that the proposed gas distribution network will be constructed in road reserves and that no easements will be required.

Clearances

Clearances to gas assets need to be maintained for asset integrity reasons, but also in the interest of public safety. This is of particular importance for transmission mains. As there are no transmission mains in the vicinity and no transmission mains are required for gas supply to the PSP, the clearances required will be standard clearances to other services located in road reserves.

6. Sewerage

North East Water is the authority responsible for the provision of sewer reticulation within the PSPs. A meeting with North East Water was held on 10 June, 2015, to discuss North East Water's strategic servicing plan for the proposed development site

6.1 Existing Services and Assets

Sewer plans provided by North East Water indicate that no gravity sewer infrastructure exists within the PSP. There is an existing transfer pump station and rising main along Baranduda Boulevard at Middle Creek. This system transfers treated sewage from the Baranduda treatment plant to an existing gravity main located just inside the northwest corner of the PSP. This existing gravity main runs through the township of Wodonga and discharges to the main sewer pump station No.1.

The sewer networks that are located in closest proximity to the precinct are the township of Baranduda to the southeast, and in the outskirts of Wodonga to the northeast. The south-eastern network consists of a 300 mm diameter trunk main that extends along Boyes Road from Baranduda Road and upsizes to a 375 mm main at the intersection of the Baranduda reticulation main and upsizes again to a 600 mm main. This main eventually connects to the Baranduda treatment plant.

This south east sewer network currently services the existing township of Baranduda south of Boyes Road as well as the Westmont Aged Care Facility. The existing network to the northwest serves development on the outskirts of Wodonga but eventually connects to the main Wodonga pump station These sewers currently have limited capacity to take additional flows from new development.

6.2 Proposed Servicing Advice

The PSP has been covered in a sewer network servicing plan undertaken by North East Water Plan 4 shown in Appendix A. North East Water has advised that the servicing plan is likely to change with ongoing strategic planning.

The PSP will be serviced by three (3) localised gravity sewer networks. Two (2) of these networks run on either side of Middle Creek within the PSP and the third borders the north and south side of Baranduda Boulevard. All three networks will drain to the existing Middle Creek sewer pump station located on Baranduda Road.

The existing pump station currently transfers sewage from the Baranduda treatment plant and discharges into the existing 300 mm diameter gravity main located near the roundabout of Baranduda Boulevard and Beechworth-Wodonga Road. North East Water have stated that the receiving gravity system is inadequate to receive the entire PSP catchment and will require upgrading over a number of years. North East Water are currently in the process of investigation the specific requirements.

The provision of a sewer distribution network to the PSPs is contingent on infrastructure extending from the north to south from existing residential areas. North East Water has advised that they will cover the cost of any capital sewer works as long as they are within the planned staging. Any

works that are required to be brought forward out of sequence will trigger contribution costs to the developer.

North East Water have advised that the sewer distribution network within the PSPs is likely to consist of mains ranging from 150 mm to 450 mm diameter. The larger size mains are to discharge to the existing pump station on Baranduda Road. The internal reticulation sewer network will largely be defined by the future developments road network and lot layout.

6.3 Key Development Opportunities and Constraints

North East Water has indicated that there is limited capacity in the existing sewer networks to the north west of the PSPs. This network is planned to receive the sewage from the PSP and will require an extensive augmentation to the network to receive the entire PSP sewage. This augmentation is currently being developed by North East Water and includes upgrading mains or duplication of mains.

As part of the overall system assessment North East Water are also investigating the option of transferring peak wet weather flows to the Baranduda treatment plant to attenuate the peak wet weather flows. This will reduce the impact on the existing receiving gravity system in Wodonga.

The preference will be for works to be staged so that new development begins closer to Wodonga and/or Baranduda and infill the east part of the PSP prior to developing the West part of the PSP. This east to west progression of development will provide the most efficient means for the North East Water to gradually upgrade and extend their networks. The sewer reticulation infrastructure required to service the PSP is planned to be constructed incrementally with the developments. If the proposed development is out of sequence with the planned upgrades any temporary servicing solution for the PSPs must be in line with the strategic servicing strategy. Invert levels, pipe sizes and locations must be such that the ultimate network can be easily integrated.

North East Water are currently investigating the capacity of the Wodonga Wastewater treatment plant and whether the plant will need to be upgraded to receive the proposed developments waste water. Upgrades to the plant will have substantial financial cost

7. Water

North East Water is the authority responsible for providing the distribution and reticulation of potable water to future residents and industries in the PSP.

7.1 Existing Services and Assets

North East Water owns the following existing trunk potable water infrastructure in the vicinity of the PSP;

- 711 mm diameter MSCL trunk main along Kiewa Valley Highway to the east of the PSP;
- 300 mm diameter uPVC trunk main along Baranduda Boulevard south of Boyes Rd
- 375 mm diameter DICL trunk main in Streets Road to the north west of the PSP
- 300 mm diameter DICL trunk main in Swansea Close to the north west of the PSP.

The 711mm MSCL trunk main runs from the Wodonga treatment plant (near the intersection of Bandiana Links Rd and Anzac Parade) to Boyes Road where it reduces down to a 600 mm trunk main. The 600 mm main continues from Boyes Road to the existing Baranduda 10 ML storage This tank is elevated to approximately 251.5 m and currently services the surrounding Baranduda area via a 300 mm GRP trunk main and areas further to the south east via a 200 mm uPVC trunk main.

Provision of water supply from the existing infrastructure to the surrounding development is the responsibility of North East Water. North East Water's potable water mains are located on the perimeter of the PSP in the northwest and southeast edges. North East Water has stated that these trunk mains have limited capacity and will not provide the entire PSP with potable water and therefore additional trunk mains and storages are required.

7.2 Proposed Servicing Advice

The PSP have been covered in a water network servicing plan undertaken by North East Water. This servicing plan is shown in Plan 5 in Appendix A and includes indicative infrastructure sizing. North East Water has advised that these are likely to change with ongoing strategic planning.

Due to the development, North East Water have planned a series of additional elevated water tanks to support the development in the PSP. The tanks are proposed to be located in three (3) separate areas. An additional 10 ML tank is to be located adjacent to the existing 10 ML Baranduda Storage Tank, the East Leneva tank (12 ML) is to be located to the west of Howards Road at Baranduda and the West Leneva tank (12 ML) is to be located to the west of Old Wodonga Beechworth Road at Leneva. North East Water has also stated that further high level tanks will be installed to provide water to high level between the heights of 220 m to 240 m.

In addition to these new storage tanks new pipework will connect to the existing network at the following locations;

- 711 mm diameter MSCL trunk main along Kiewa Valley Highway to the east of the PSP;
- 225 mm extension of the 300 mm diameter uPVC trunk main along Baranduda Boulevard south of Boyes Rd

- 150 mm extension of the 375 mm diameter DICL trunk main in Streets Road to the north west of the PSP
- 450 mm extension of the 300 mm diameter DICL trunk main in Swansea Close.
- 375 mm diameter main connection to the existing 14 ML clear water storage in Donnington Drive

North East Water has advised that the cost for proposed capital works and shared water assets will be paid for by the water authorities as long as these are within the planned upgrade timeframes. However, if the works are required ahead of time costs will be brought forward and will be borne by the developer. Developers will also be required to pay a developer contribution fee to North East Water of approximately $779 per lot. The internal water reticulation supply will be borne by the developer.

7.3 Key Development Opportunities and Constraints

Similar to the sewer system the preference will be for works to be staged so that new development begins closer to Wodonga and/or Baranduda and infill the east part of the PSP prior to developing the West part of the PSP. This east to west progression of development will provide the most efficient means for the North East Water to gradually upgrade and extend their networks. The water reticulation infrastructure required to service the PSP is planned to be constructed incrementally with the developments. If the proposed development is out of sequence with the planned upgrades any temporary servicing solution for the PSPs must be in line with the strategic servicing strategy.

Albury Wodonga Development Corporation installed large diameter trunk mains for future development along the growth corridor for Wodonga which includes the PSP area. For example there is a 711 mm diameter trunk main along Kiewa Valley Highway that reduces to a 600 mm main at Boyes Road. This was installed to provide Baranduda and other developments to the south east of Wodonga. The development of the PSP will actually benefit the water system as the current system has long detention times due to the large pipe size and low water demand. Due to the large size of trunk mains in the area there will be enough capacity to supply water to the area for several years without large infrastructure construction. North East Water have allowed in the planning strategy for the construction of three new storage tanks, two new ones at West Leneva (12 ML) and East Leneva (12 ML), and an additional 10 ML tank to be installed adjacent to the existing 10 ML tank at Baranduda. These are planned to be built in 2030 and 2045.

North East Water are currently investigating the capacity of the Wodonga treatment plant and whether the plant will need to be upgraded to provide the proposed development with water. Upgrades to the plant will have substantial financial cost

8. Recycled Water

North East Water is the authority responsible for providing the supply of class A recycled water to future residents and industries in the PSPs. Class A recycled water is the quality of water required for high exposure uses such as flushing toilets and watering gardens, however it is not intended for drinking. Currently the Baranduda Treatment plant treats the wastewater to a Class C standard. North East Water has engaged a consultant to produce an Integrated Water Management Plan that includes an investigation into the feasibility for supplying recycled water to future developments including the PSP.

8.1 Existing Services and Assets

The Baranduda Water Treatment Plant is located approximately 1.2 km to the east of eastern edge of the PSP. Currently it does not supply any recycled water. The treatment plant treats the waste water to a class C standard but this is not provided for supply and discharged to the Wodonga Treatment Plant sewer network.

There is no recycled water infrastructure located within the PSPs.

8.2 Proposed Servicing Advice

North East Water have engaged a consultant to produce a Whole of Water Management Plan. Included in this plan is the feasibility assessment on the Baranduda Water treatment plan to provide recycled water to the PSP and other areas in the vicinity. North East Water have advised that upon completion and review of this report they will make a decision on the whether recycled water will be provided from the Baranduda Plant.

8.3 Key Development Opportunities and Constraints

To provide Class A water to the PSP North East Water must upgrade the Baranduda treatment plant and install separate supply mains to the PSP. This will come at a considerable cost with no immediate benefit to the authority. In discussions with North East Water they have indicated that the costs associated with providing recycled water trunk mains and upgrading the treatment plant to treat the waste water to a Class A standard is in the order of $58 million dollars.

9. Stormwater

The City of Wodonga is the authority responsible for managing stormwater throughout the PSP.

9.1 Existing Services and Assets

Currently there are minimal stormwater drainage assets in the area with open drain systems running parallel to the road network the predominant feature. The majority of stormwater from the PSP area drains into Middle Creek which discharges into the Kiewa River.

9.2 Proposed Servicing Advice

The PSP will be serviced by underground pipe system for smaller rainfall events with the road network or large open drains to transfer the overland flow. The stormwater from the developments is proposed to discharge into retardation basins and/or wetlands that are to be at selected locations either side of Middle Creek. The basins and wetlands locations have been proposed in a draft report submitted to Council. The locations of are shown in Plan 8 in Appendix A.

The internal stormwater network will largely be defined by the future developments road network and lot layout. There is a separate report 'Leneva Whole of Water Cycle Management Plan' that has been commissioned by North East Water and City of Wodonga that will deal with all aspects of the water cycle including possible storage and reuse options. These aspects have therefore not been included in this report.

Currently there is a draft report with City of Wodonga Council that outlines the maximum flood line of Middle Creek as well as nominating areas for retardation basins for stormwater attenuation and wetlands for stormwater treatment. The initial outlay for the construction of the wetlands and retardation basins are normally paid for by Council. A Developer Contributions Scheme may be utilised by Council to recoup the initial money outlay. The internal drainage system will be borne by the developer

9.3 Key Development Opportunities and Constraints

Similar to other services the staging of the developments will have to be managed so that Council does not have a large financial outlay to construct wetland systems and/or retardation basins for developments constructed out of sequence.

10. Funding Arrangements

10.1 Water Supply and Sewerage

10.1.1 General

Planning permit applications are referred to a number of statutory authorities including water retailers. A condition generally included is that any developer of subject land, must enter into an agreement with the relevant Water Retailer to provide water, sewer services and possibly recycled water and meet all requirements to the water retailer's satisfaction, in this case North East Water.

Whilst Water Retailers have a general contributions policy, as detailed in the following section, specific details of the financial, servicing and special conditions that the developer must meet are described in the Development Deed, produced as part of any development.

Developers must meet all of these conditions before the water retailer will issue its consent to the issuing of a Statement of Compliance to Council, as required by section 57 of the Subdivision (Procedures) Regulations 1989.

Where existing water and /or recycled water mains need to be realigned or abandoned due to the redevelopment or changes to the subdivision of land, the owners must pay all costs associated with such works.

10.1.2 Water Retailer Contributions Policy

Developers are required to make standard regulated development contributions as well as fund the construction of the water reticulation network within developments. New customers make an up-front contribution to the costs of connecting to existing water and sewerage networks. Existing customers are also required to contribute to the costs of new infrastructure when they connect to additional services.

Water Retailers and developers must provide services in accordance with Essential Services Commission's Guidelines as detailed below

- Water Retailers are responsible for providing shared distribution assets and temporary shared works
- Developers are responsible for providing reticulation assets and temporary reticulation works
- Developers are responsible for the financing costs associated with bringing forward the provision of shared distribution assets and temporary shared works
- Developers are responsible for the cost of connecting their development to the water retailer's shared infrastructure assets
- Developers are responsible for the installation and financing of dedicated assets to service their development

Shared distribution assets are infrastructure assets that are generally provided for more than one development and do not include reticulation assets

Water Retailers are responsible for providing shared distribution assets which are funded by New Customer Contributions.

Where shared distribution assets are required to be installed by a developer that are over and above what the developer requires the Water Retailers will refund the developer the difference in estimated or tendered value of the works, including an allowance for design, project management, and survey costs. For example if the developer requires a 300 mm main to supply their development but a 450 main is installed for future developments, the Water retailer will refund the cost difference between installing 450 mm pipe as compared to a 300 mm pipe.

Asset size thresholds are for guidance only. The key determinant of whether an asset is a reticulation asset or a shared asset is the number of developments it serves. A reticulation asset is the minimum sized asset to serve one development.

If the asset has been upsized in any way from the minimum requirements to serve the development or had its location or route altered to serve future developments it should be considered a shared asset.

New Customer Contributions

Water Retailers may levy new customer contributions by scheduled or non-scheduled charges. Non-scheduled charges may be applied if the financing costs associated with the Water Retailer bringing forward the provision of shared distribution assets and/or temporary shared works to an out-of-sequence development exceed the approved scheduled charge.

New customer contributions are charged on an allotment basis where a lot is defined as separately titled property or any dwelling that can be separately metered. New customer contributions for water and sewer for North East Water are as follows:

- Sewer - $1,817.60
- Water - $779.00

These contributions are for 2015 -2016. After this period these contributions will be reassessed by the Essential Services Commission. It is expected that the new contribution amounts will reflect the increase in CPI.

Application Fees

Application fees are required to be paid by developers in accordance with the relevant water retailer's land development and pricing policies.

Application fees may be charged due to:

- A connection to / extension of the Water Retailer's network(s)
- Subdivision auditing and administration
- Subdivision planning and development
- Supply of pressure and flow information
- Build over or creation of an easement
- Operations and maintenance for temporary works

10.3 Electricity

Costs associated with upgrades to the electricity transmission and distribution network to zone substation level are typically funded by the distribution business. These upgrades are planned in response to load growth, therefore provision of redevelopment densities and staging to the distribution business is crucial to allow planning for growth to occur in a timely manner.

The distribution business typically pays for new 22kV feeders and local substations and kiosks required to supply new developments. The developer is required to pay for the installation of the electricity supply from the kiosk to the development as well as any civil works for HV cabling. The scale of cost for these works depends on the distance from the development to existing infrastructure and the size of assets required. Costs would be determined by the distribution business on a case by case basis.

Costs associated with relocations and undergrounding of existing overhead power lines to suit redevelopment aspirations are typically attributable to the developer that requests the works. Costs associated with undergrounding works may also need to include relocations of kiosk substations, undergrounding of existing connections to third party properties, new light poles and public lighting assets. Estimating the cost of undergrounding is difficult and relies on the above, plus the capacity of the existing asset amongst other things.

In an instance where a developer proposes to develop a portion of land out of sequence to the rest of the development this will prove more difficult to manage as the planning, construction and costs will be substantial and these costs shall be borne by the developer.

10.4 Gas Supply

There are two types of tariff arrangements for gas customers depending on the volume of gas required, Tv (tariff volume) and Td (tariff demand) customers. Customers such as residential developers usually fall into the category of a Tv customer. Td customers have an extremely high peak hourly load (10,000MJ/hour) or annual volume required (10TJ/annum). Cost for gas is less expensive for Td customers but they are liable for greater capital costs in financing extensions and network augmentation.

In line with regulatory requirements gas project funding is determined in several ways. Where a connection request is made for commercial and residential sites, future gas distribution revenues for the site are calculated and offset against the construction costs associated with the gas assets.

Where a shortfall occurs, it is the responsibility of the applicant / developer to finance the deficit in order for the project to proceed.

Where a request is made for installation of a gas main to a building or site for the purposes of enabling future connection, with no connection requests being current at the time of installation, the full construction cost is passed on to the developer.

If specific developments require upgrades to the existing network in order to meet load and/or metering pressure requests, APA Gas Networks will pay for the upgrade if it is a residential type development. If the upgrade is due to one large customer, APA Gas Networks will request a one off contribution from the customer.

10.5 Telecommunications

10.5.1 NBN Requirements

The majority of the PSP is covered by the fixed wireless network. For the areas that are not covered by the fixed wireless network, the developer will have to fund the cost of installing underground infrastructure.

Compliance to the Building Code of Australia for all cabling and with reasonable directions provided by authorised developers, builders, owners, managers and customers in respect to building and fire authority requirements. In the cases where requests are received which are regarded as unreasonable, advice may be sought.

10.6 Stormwater

Developers are required to fund the construction of the drainage network within developments. The initial outlay for the construction of the wetlands and retardation basins are normally paid for by Council. A Developer Contribution Scheme may be utilised by council to recoup the initial money outlay.

11. Conclusion

This assessment analysed existing infrastructure in and around PSP southwest of Wodonga and aimed to identify any constraints or opportunities and determine the ability of the existing service networks to accommodate predicted residential, commercial and industrial development and the investment associated with any infrastructure works required.

Trunk services investigated include electricity, telecommunications, gas, sewerage, water, recycled water and stormwater. A separate report is being prepared which will deal with all the aspects of the water cycle including the possible storage and reuse of stormwater.

Key findings by utility are summarised in Table 1

Table 1 Key Findings for the Provision of Services

Sector	Key Findings
Electricity	• The development will initially be fed from existing feeders with future demand being met with the most cost effective solution at the time. • Ausnet will upgrade the network when required with the most cost effective solution available at the time. • Costs associated with undergrounding electricity lines are expected to be borne by developers • Works at the zone or terminal station level and in the transmission network are predicted not to be required.
Telecommunications	• NBN is already provided to the majority of the PSP by a fixed wireless network • Future telecommunications to the proposed development will be the responsibility of Telstra
Gas Supply	• APA owns a high pressure transmission gas main which terminates in Hume St Wodonga. The PSP will be supplied by the extension of reticulation mains • No existing distribution infrastructure is located within the precinct however the PSPs can be adequately serviced through connecting two existing 180 mm mains located at the northern and south eastern corners of the PSP. • The financing of extensions of the gas network are economically feasibility tested and costs may be attributable to the developer who requests the extension.
Water Supply & Sewerage	• North East Water Plans indicate no sewer gravity system or recycled water infrastructure within the PSPs • The PSPs will be serviced by a gravity sewer network which will drain to the existing Middle Creek pump station. This pump station is planned to be upgraded in as the development progresses. The gravity main in Wodonga

Sector	Key Findings
	that will receive the developments sewage in limited in capacity and will require upgrading. • Developers will be required to make standard regulated development contributions as well as fund the construction of the reticulation network within developments • Current investigations will determine if the existing Baranduda treatment plant and main Wodonga treatment plant will require upgrading. • The provision of recycled water is under investigation. There are no recycled water assets in the vicinity of the PSP. The supply of recycled water will require substantial upgrade to the existing treatment plant and a new pipe network at substantial cost.
Stormwater	• There is no existing underground system available for receiving stormwater discharge. • A draft report currently with Council sets aside areas in the PSP for wetlands and retardation basins. • The 'Leneva Whole of Water Cycle Management Plan' is being produced that deals with all aspects of the water cycle including possible storage and reuse options.

Appendices

Appendix A Services Plans

Plan 1 Existing Electricity Infrastructure

Plan 2 Existing Telstra Infrastructure

Plan 3 Existing Gas Infrastructure

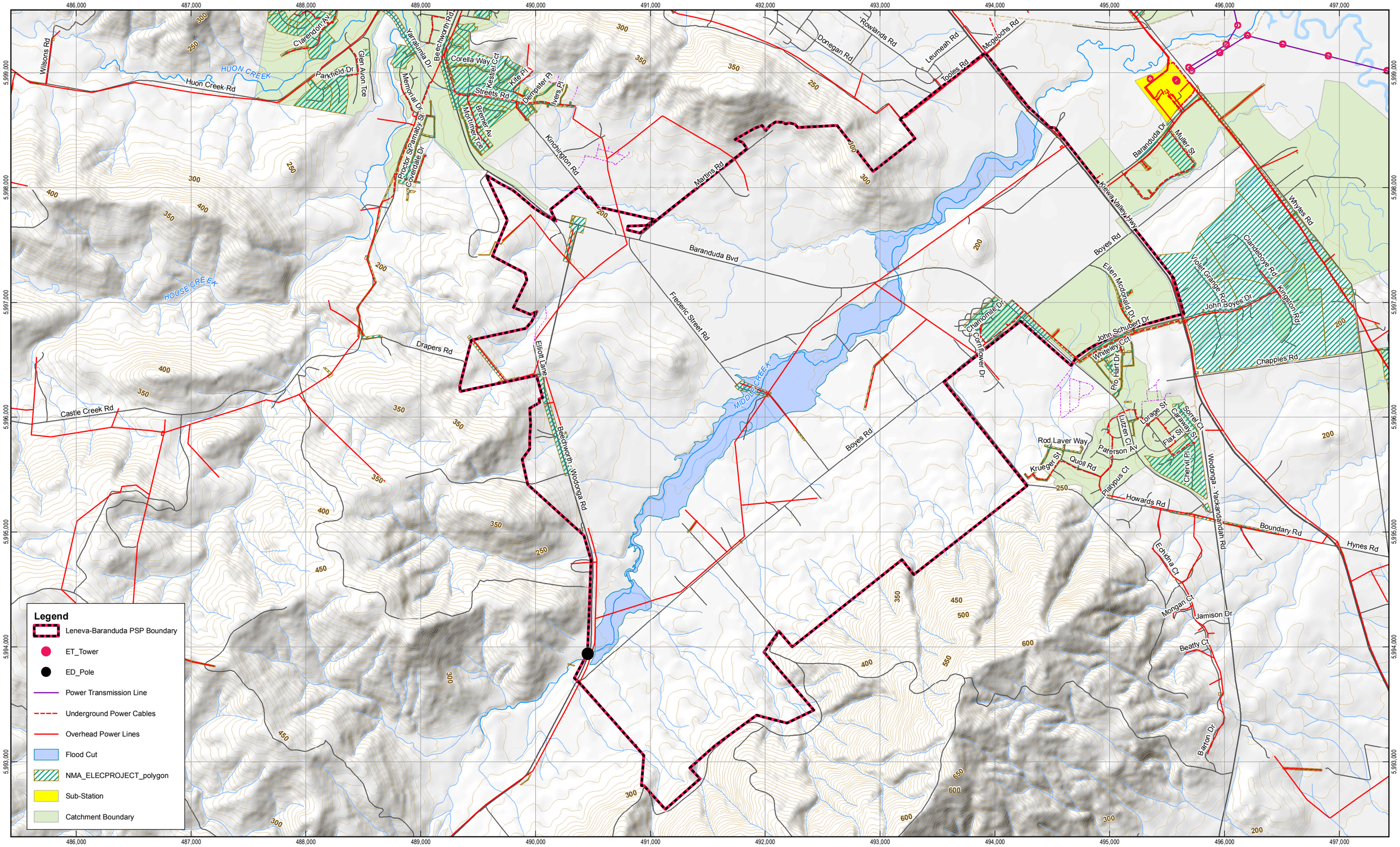
Plan 4 Proposed Trunk Sewer Infrastructure

Plan 5 Proposed & Existing Water Infrastructure

Plan 6 Combined Infrastructure

Plan 7 NBN Rollout

Plan 8 Stormwater Infrastructure



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Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

LEGEND

- Leneva-Baranduda PSP Boundary
- Highway
- Arterial
- Collector
- Proposed
- Tracks
- Watercourse
- River
- Stream
- Drain/Channel/Other
- Contour 10 m

Melbourne Planning Authority
Infrastructure Assessment

Job Number	31-32956
Revision	A
Date	17 Jul 2015

Leneva-Baranduda PSP
Existing Electricity Infrastructure

Plan 1

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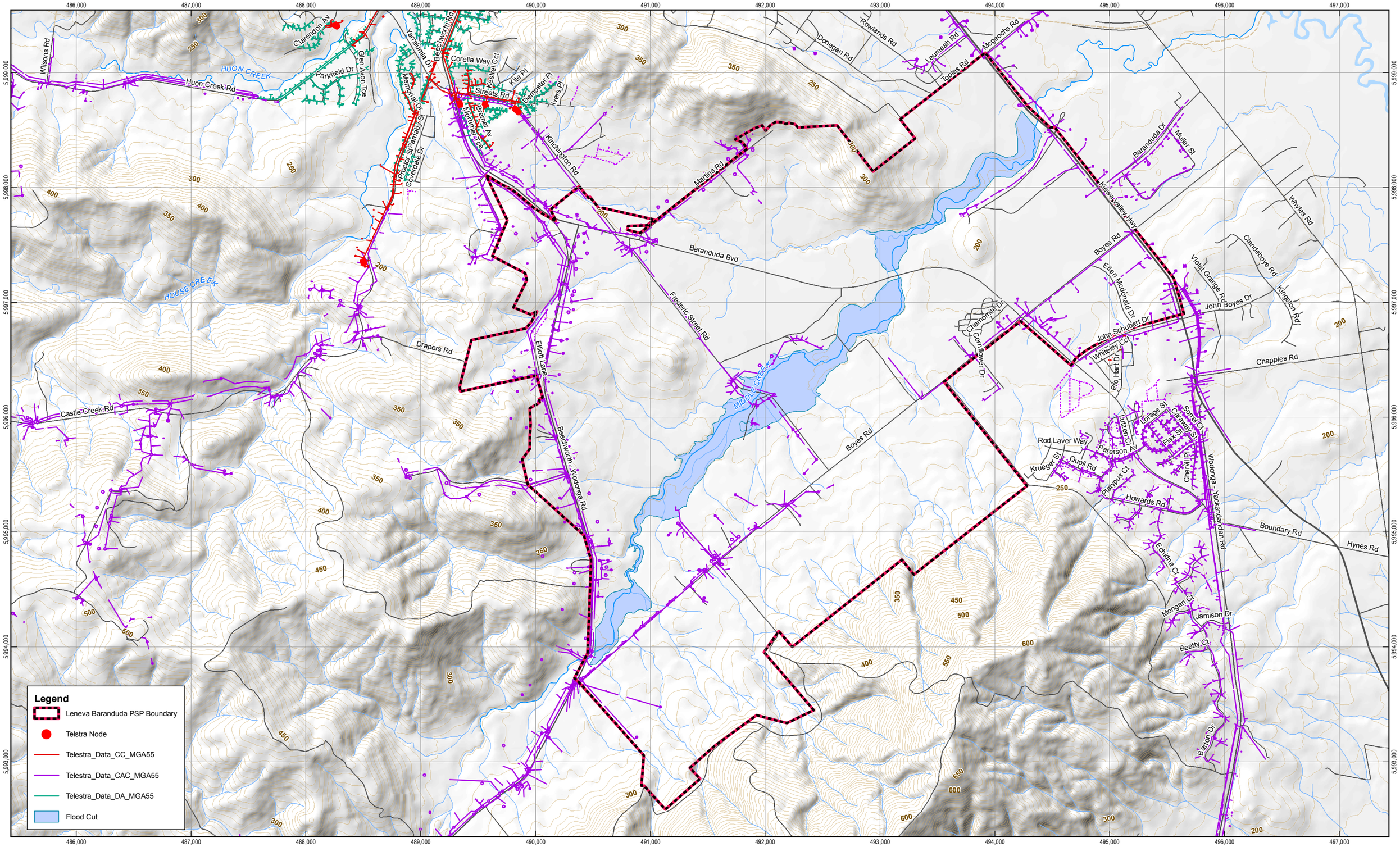
Data source: VicMap, DEPI (2015) and DBYD data. Created by:lrsmith

180 Lonsdale Street Melbourne VIC 3000 Australia **T** 61 3 8687 8000 **F** 61 3 8687 8111 **E** melmail@ghd.com **W** www.ghd.com



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LEGEND

Highway | Arterial | Collector | Proposed | Tracks | Watercourse | River | Stream | Drain/Channel/Other | Contour 10 m

Melbourne Planning Authority
Infrastructure Assessment

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Leneva-Baranduda PSP
Existing Telstra Infrastructure

Plan 2

G:\31\32956\GIS\Maps\Working\3132956_Plan2_TelstraInfrastructure_A3L.mxd

Data source: VicMap, DEPI (2015) and DBYD data. Created by:lrsmith

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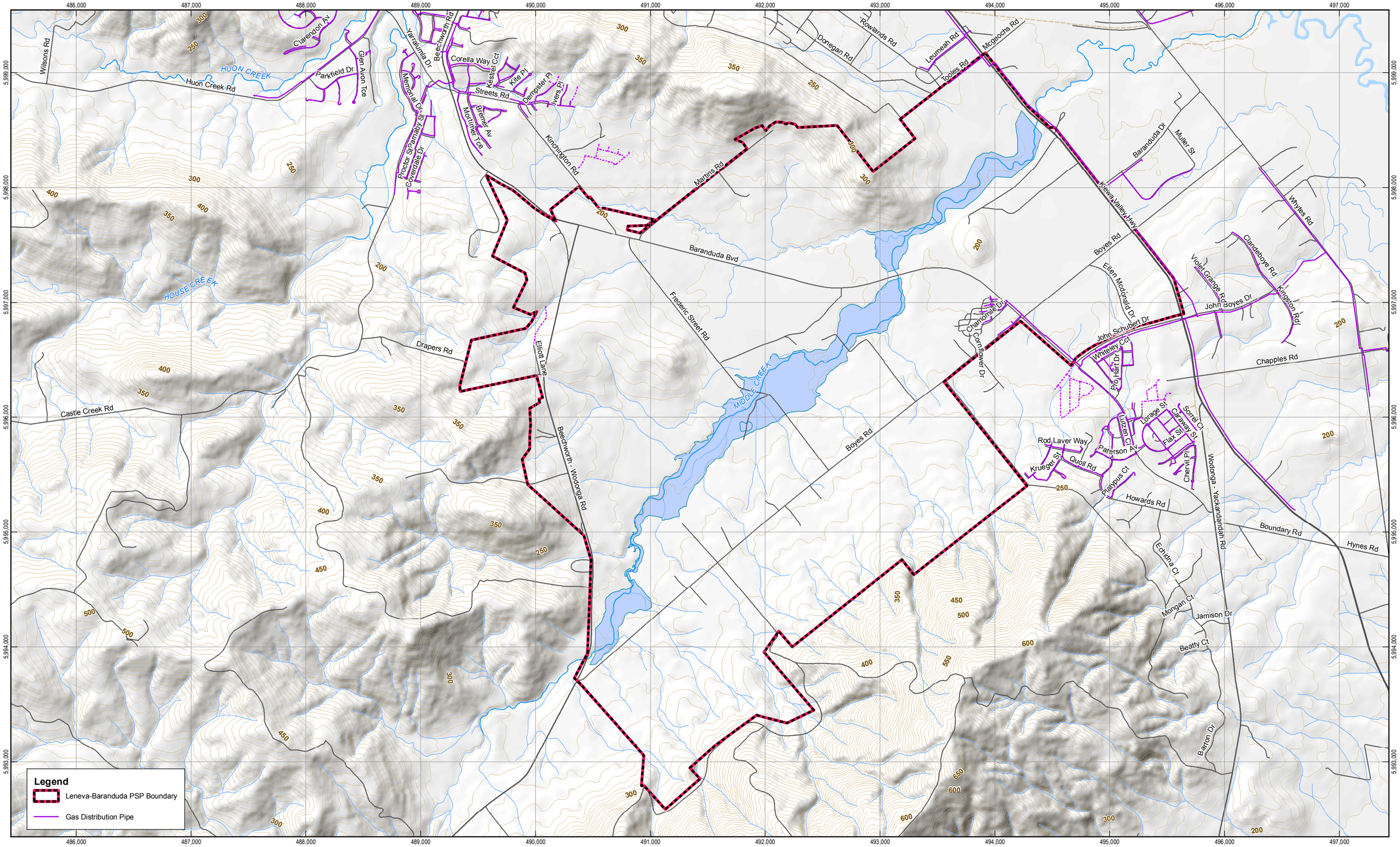

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Grid: GDA 1994 MGA Zone 55

N

LEGEND

Highway
Arterial
Collector
Proposed
Tracks
Watercourse
River
Stream
Drain/Channel/Other
Contour 10 m

Melbourne Planning Authority
Infrastructure Assessment

Job Number	31-32956
Revision	A
Date	17 Jul 2015

Leneva-Baranduda PSP
Existing Gas Infrastructure

Plan 3

G:\31\32956\GIS\Maps\Working\3132956_Plan3_GasInfrastructure_A3L.mxd

Data source: VicMap, DEPI (2015) and DBYD data. Created by:lrsmith

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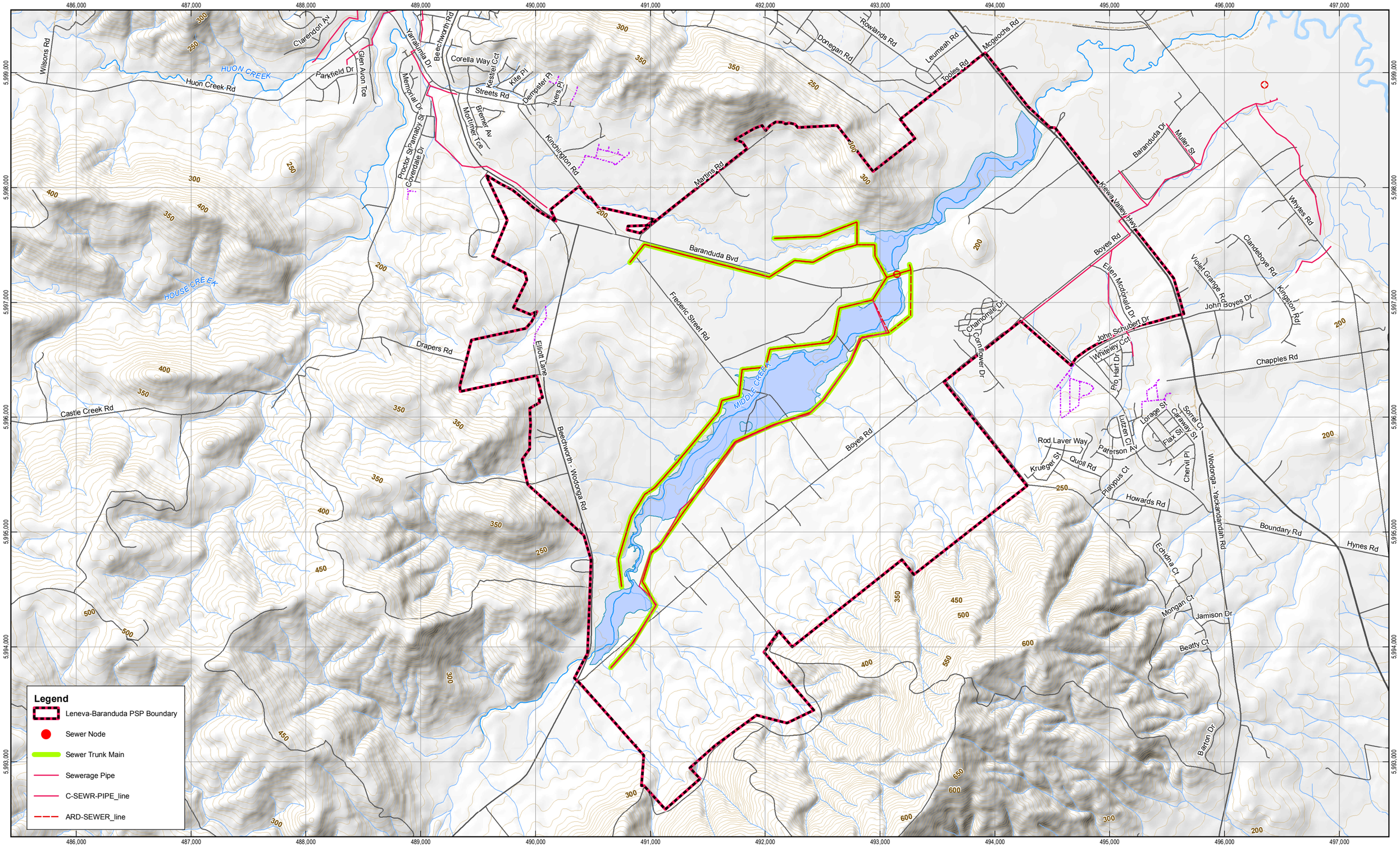

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Metres

Map Projection: Transverse Mercator
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Grid: GDA 1994 MGA Zone 55

N

LEGEND

Highway | Proposed | River | Contour 10 m
Arterial | Tracks | Stream
Collector | Watercourse | Drain/Channel/Other

Melbourne Planning Authority
Infrastructure Assessment

Job Number	31-32956
Revision	A
Date	17 Jul 2015

Leneva-Baranduda PSP
Proposed Trunk Sewer Infrastructure Plan 4

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Data source: VicMap, DEPI (2015) and DBYD data. Created by:lrsmith

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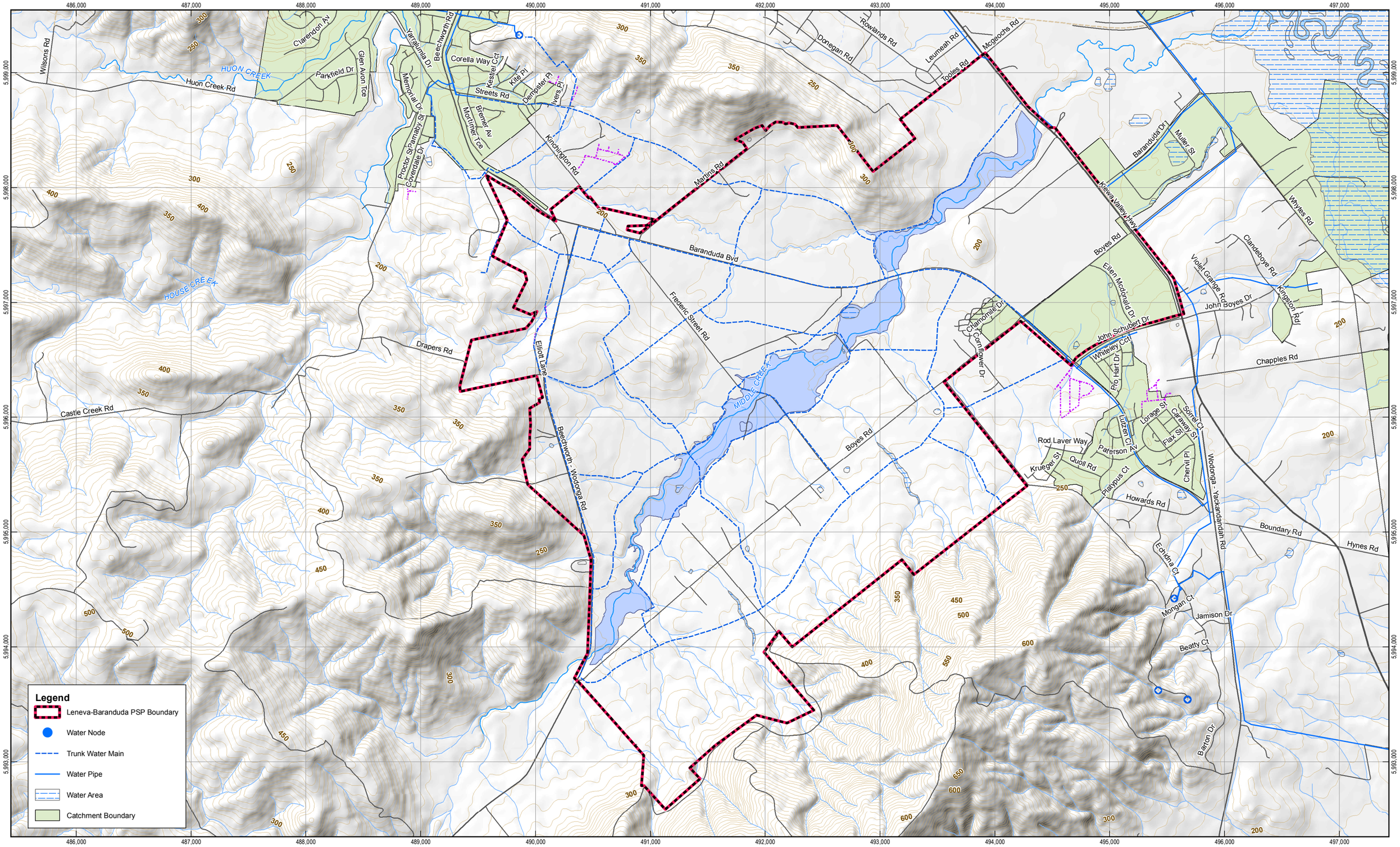

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Metres

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Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

LEGEND

Highway
Arterial
Collector
Proposed
Tracks
Watercourse
River
Stream
Drain/Channel/Other
Contour 10 m

Melbourne Planning Authority
Infrastructure Assessment

Leneva-Baranduda PSP
Proposed & Existing Water Infrastructure

Job Number 31-32956
Revision A
Date 17 Jul 2015

Plan 5

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Data source: VicMap, DEPI (2015) and DBYD data. Created by:lrsmith

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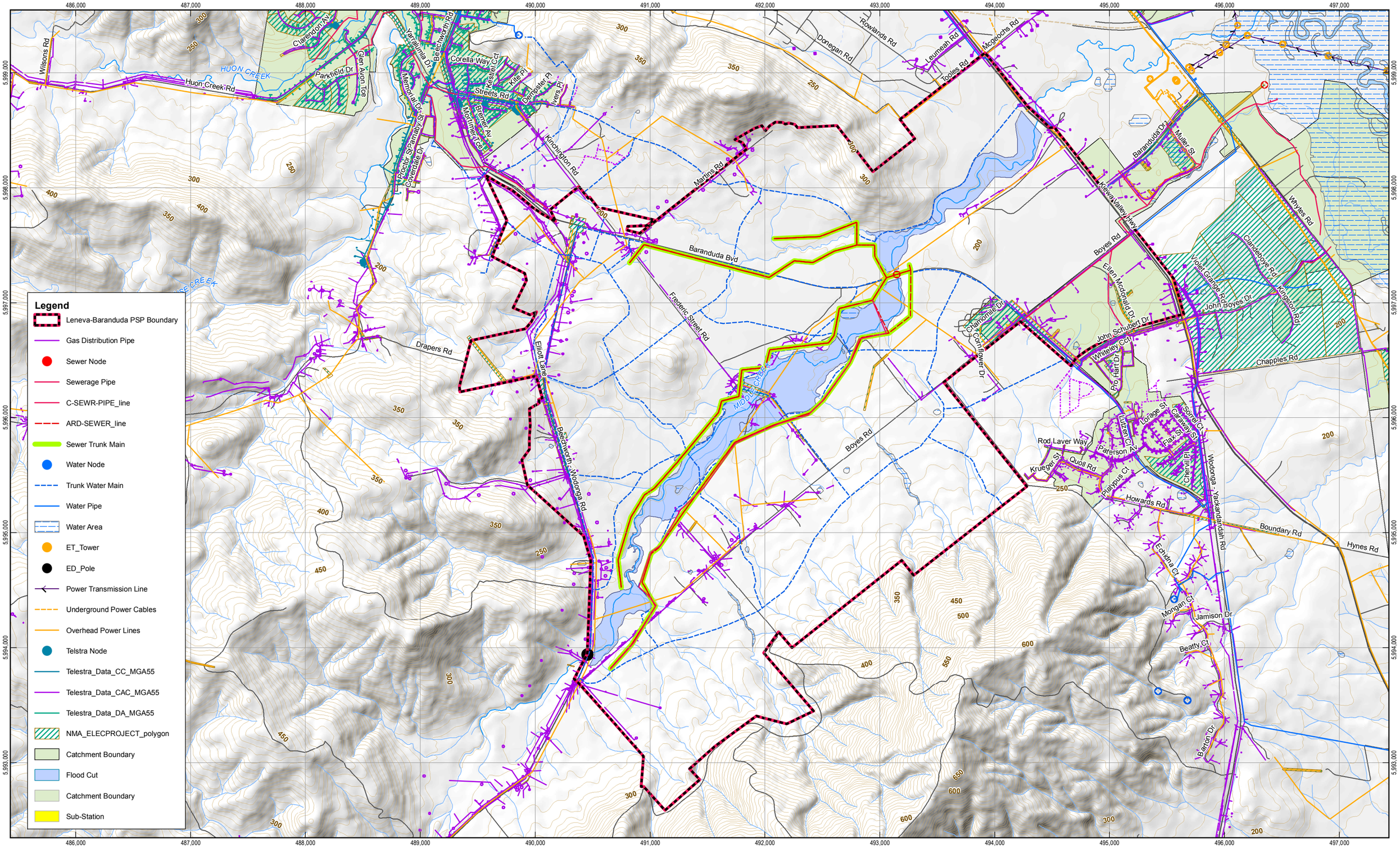

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Grid: GDA 1994 MGA Zone 55

N

LEGEND

Highway | Arterial | Collector | Proposed | Tracks | Watercourse | River | Stream | Drain/Channel/Other | Contour 10 m

Melbourne Planning Authority
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Leneva-Baranduda PSP
Combined Infrastructure

Plan 6

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Data source: VicMap, DEPI (2015) and DBYD data. Created by:lrsmith

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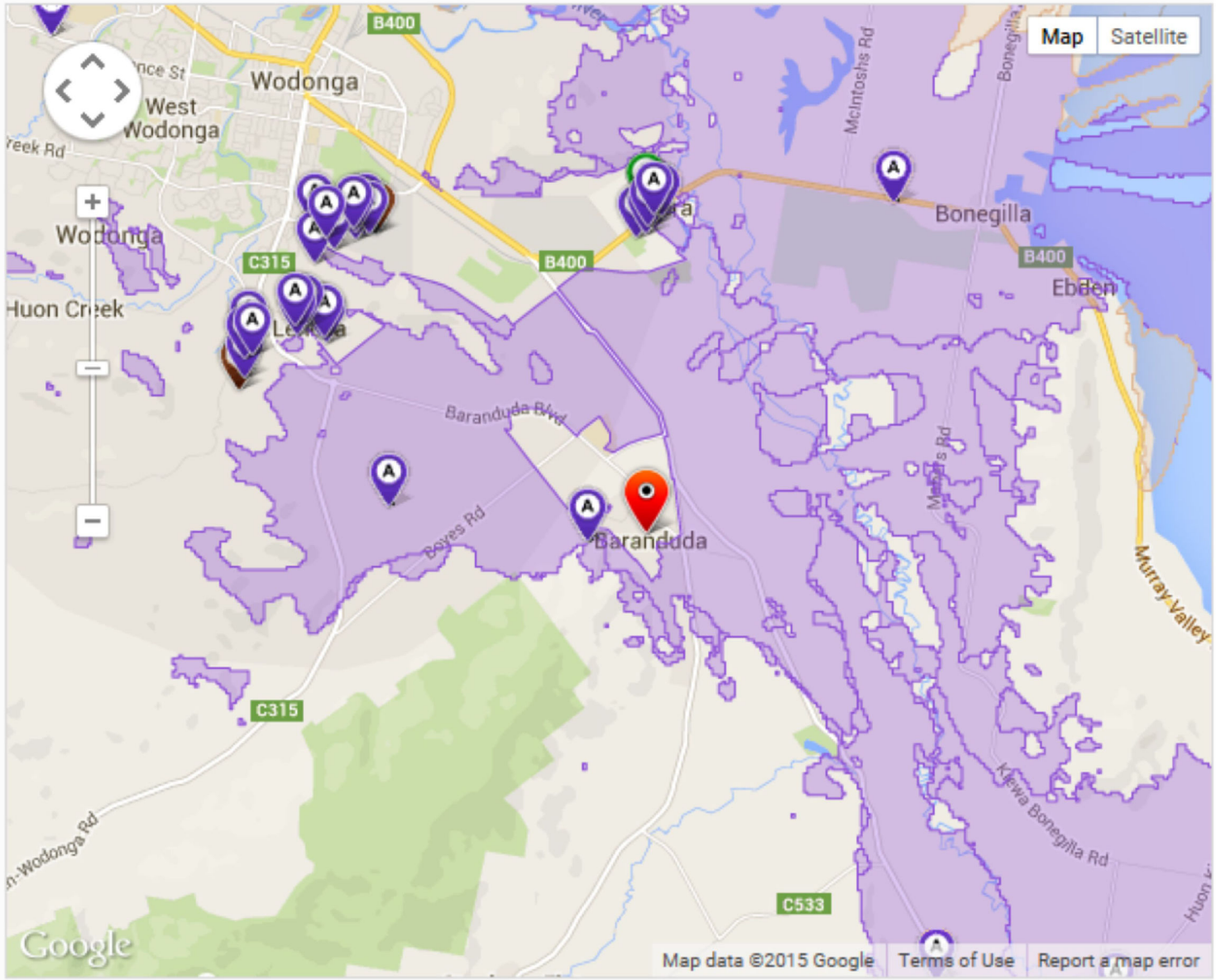

Service available
Fixed line
Fixed wireless

Not to Scale

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

LEGEND

Melbourne Planning Authority
Infrastructure Assessment

Job Number 31-32956
Revision A
Date 17 Jul 2015

Leneva-Baranduda PSP
NBN Rollout

Plan 7

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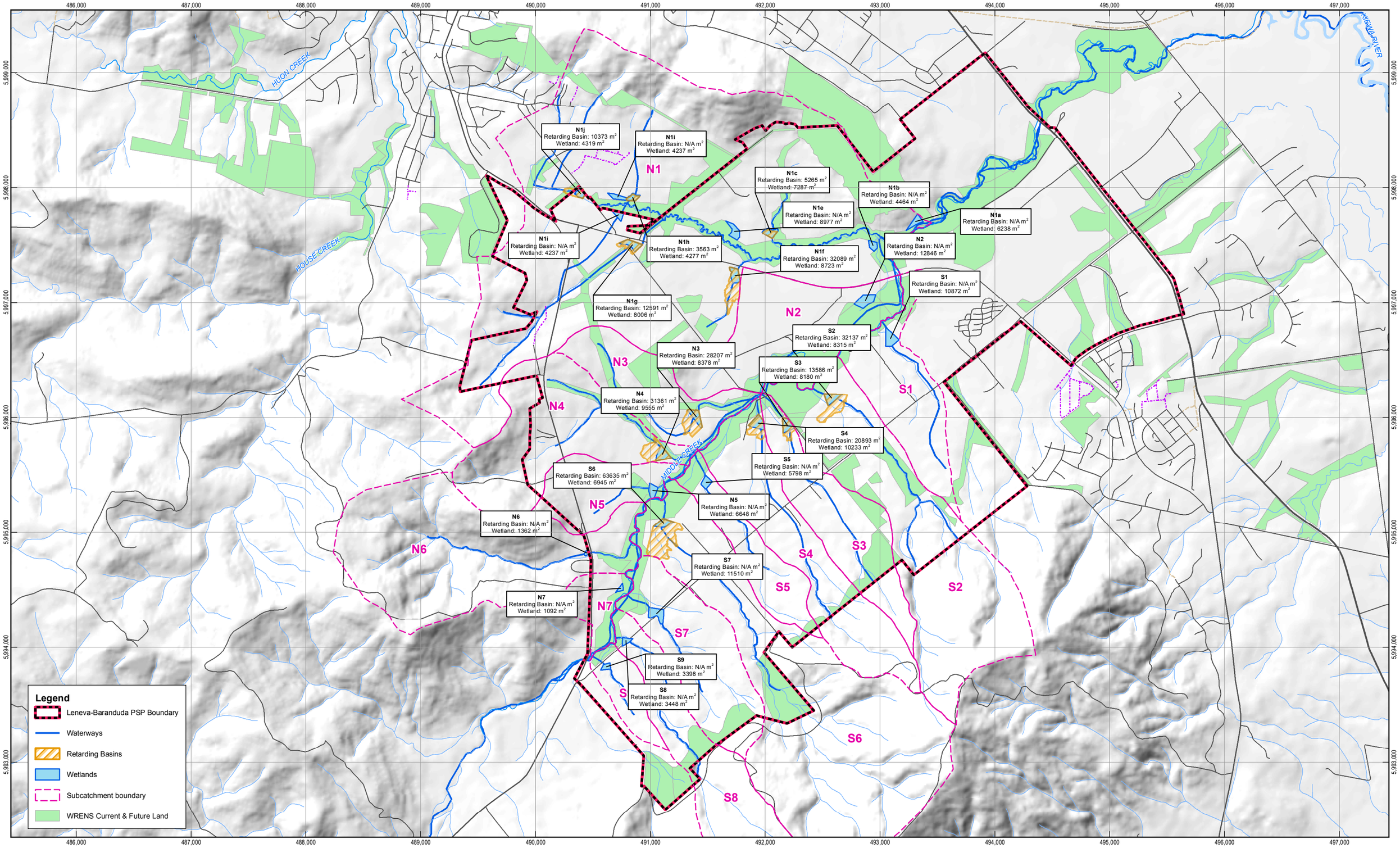
Data source: Telstra - NBN Rollout web site and Google maps. Created by:lrsmith



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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

LEGEND

Highway
Arterial
Collector
Proposed
Tracks
Watercourse
River
Stream
Drain/Channel/Other

Melbourne Planning Authority
Infrastructure Assessment

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Leneva-Baranduda PSP
Stormwater Infrastructure

Plan 8

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Data source: VicMap, DEPI (2015) and DBYD data. Created by:lrsmith

180 Lonsdale Street Melbourne VIC 3000 Australia **T** 61 3 8687 8000 **F** 61 3 8687 8111 **E** melmail@ghd.com **W** www.ghd.com

Appendix B Key Contact List

Electricity

- Paul Hofman, Ausnet
- Richard Martin, Ausnet

Gas

- Peter Nugent, APA Group
- Mark Baker, SP Ausnet

Sewer, Water, Recycled Water

- Ascher Derwent, North East Water
- Les Ryan, North East Water

GHD

105 Hume Street
Wodonga VIC 3690 Australia PO Box 992
T: 61 2 6043 8700 F: 61 2 6043 8711 E: abxmail@ghd.com

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